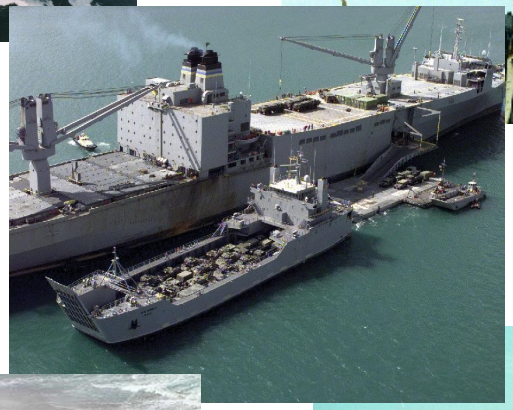
Coastal Integrated Throughput Model



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ANL

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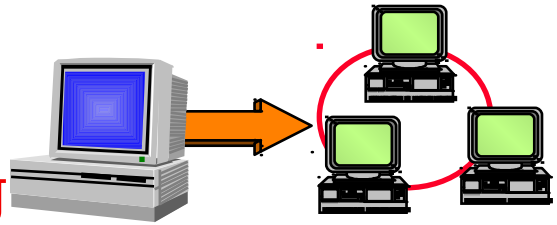
Planned CITM Uses

- **Measure of impact of JLOTS decisions on force projection**
- **Link via PORTSIM to existing flow models (FPM/AMP)**
- **Identification of limiting factors to throughput**
- **Objective site selection for JLOTS**

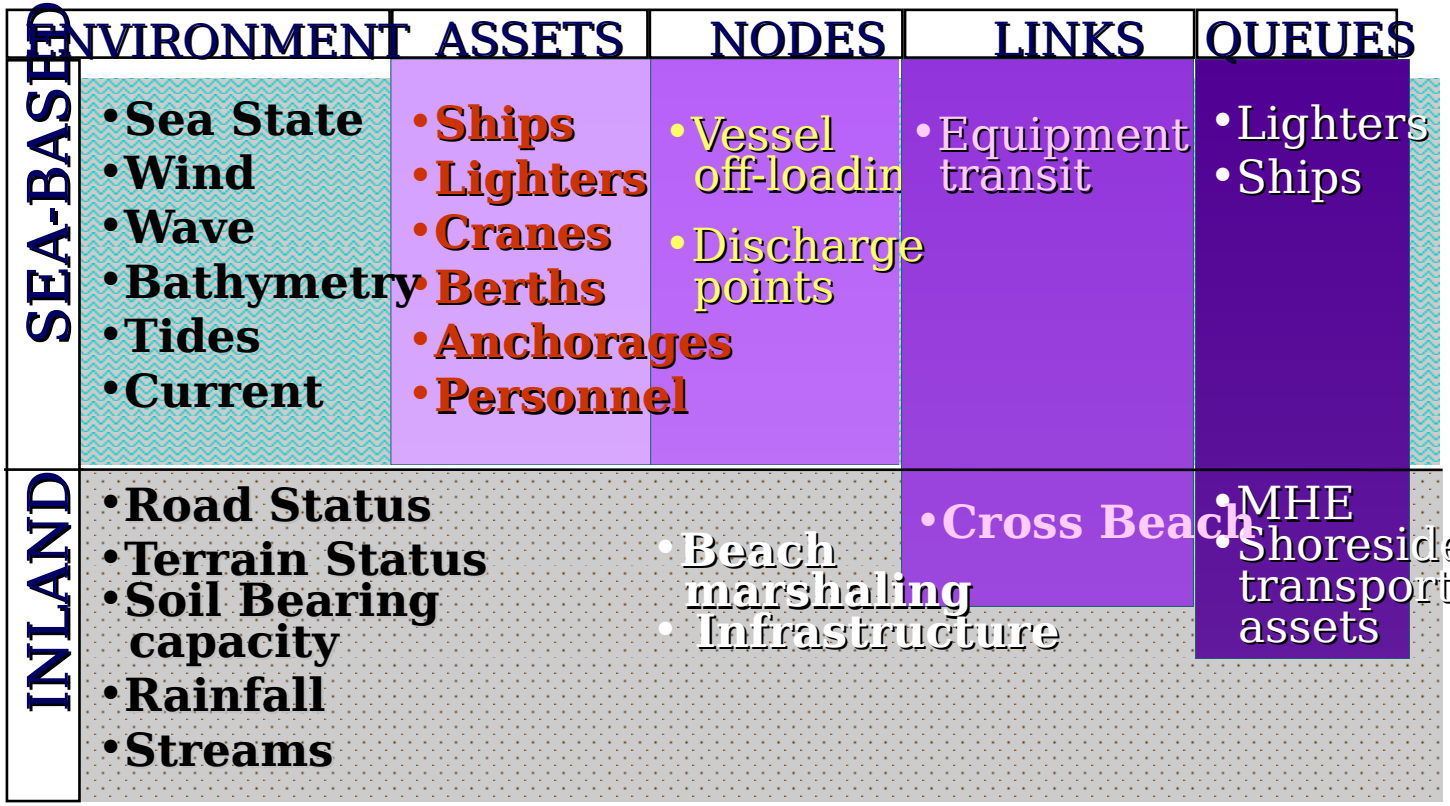


- **Tool to evaluate emerging technology**
- **Time-domain simulation for War-gaming exercises (w/OneSAF, WARSIM**

“JLOTS is a system of systems”

- Very complex
- Very nonlinear
  - must account for bottlenecks/problems
- Extremely affected by environmental conditions
  - sea state varies day-to-day and year-to-year
  - tides and nearshore bars
  - must connect to inland throughput capabilities
- Only an objective time-domain tool can

CITM
SYSTEM COMPONENTS

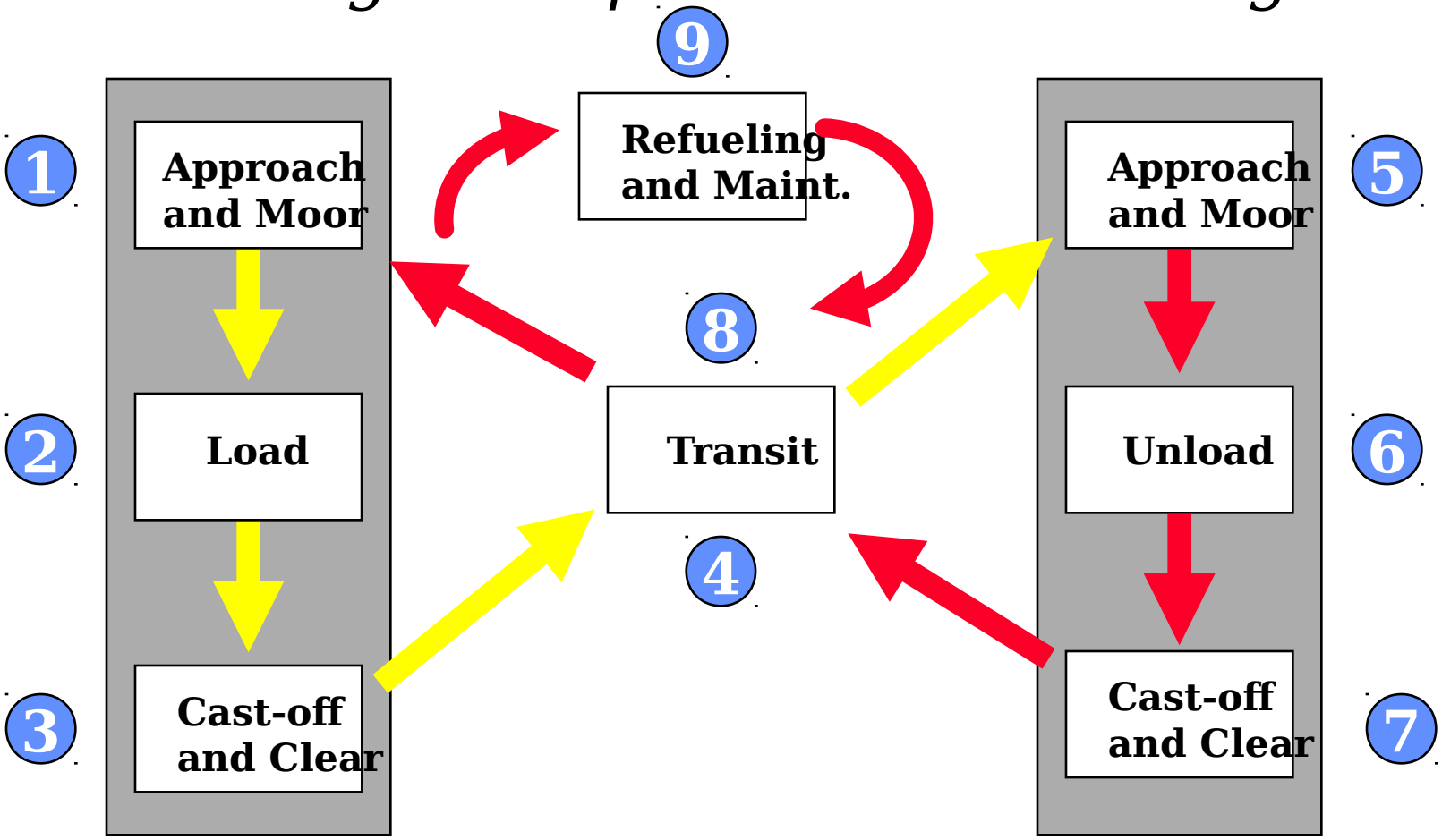


Ship Discharge

Lighter Operations

Shore-based Offload Operations

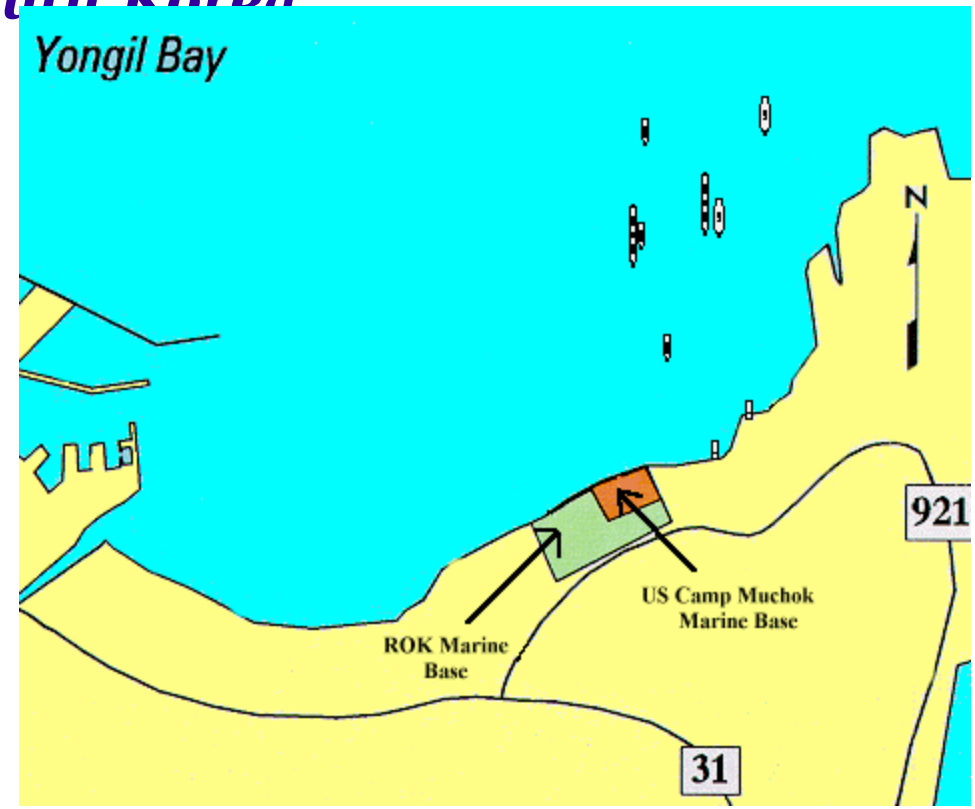
Lighter Operations Flow Diagram



User Inputs (Scenario)

Sample Input Screen

Using Area Near Port of Pohang, South Korea



- ***Number:***

  ships

  lighters

  shore sites

- ***Type:***

  ships

  lighters

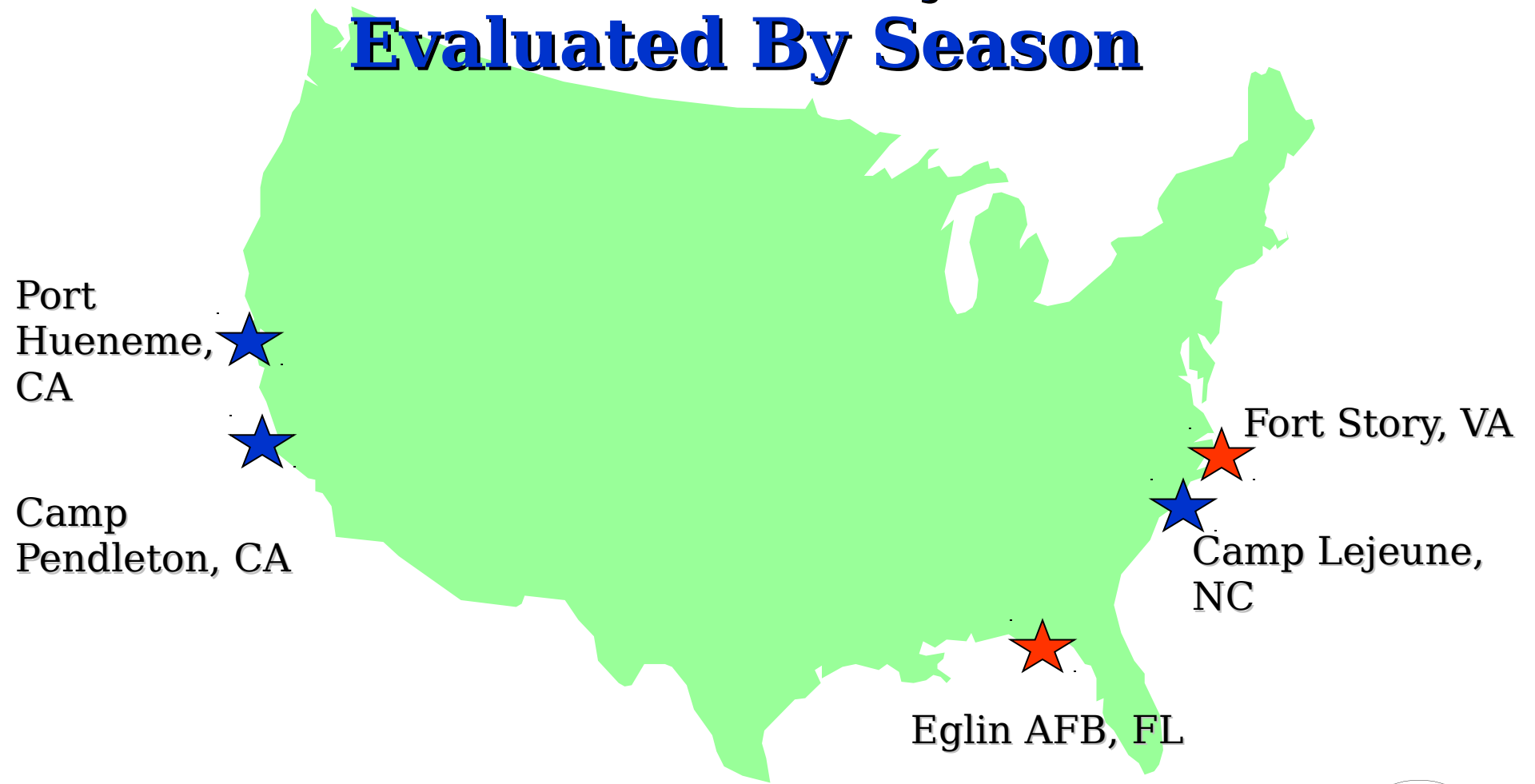
  shore sites

- ***Location:***

  ships

  lighters

CONUS LOTS Training Sites Previously Evaluated By Season



Test Case Scenario for Ft. Story and Eglin AFB

Offshore Nodes

- **1 Fast Sealift Ship (FSS)**
- **1 LMSR**

Onshore Nodes

- **1 ELCAS**
- **2 Bare Beach Sites (Splashpoints)**

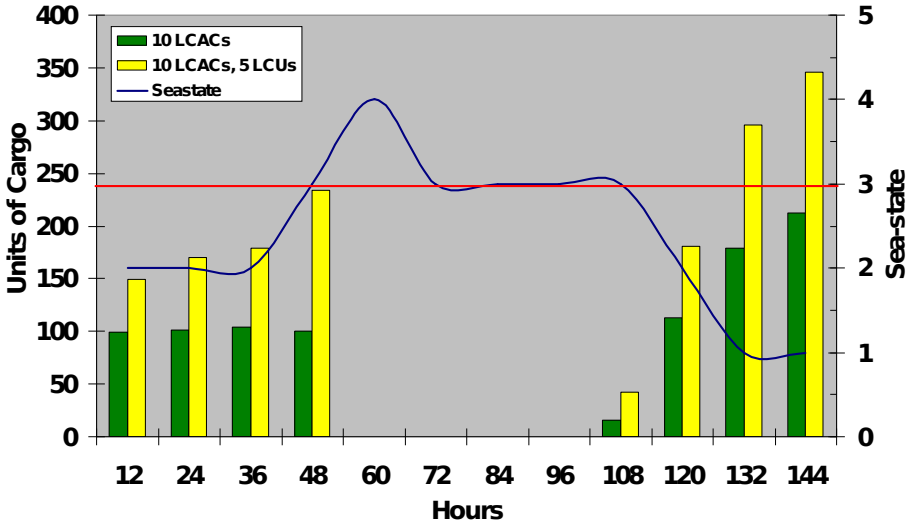
Conditions

- **6 total days simulated**
- **Month of February**
- **RO/RO and LO/LO**

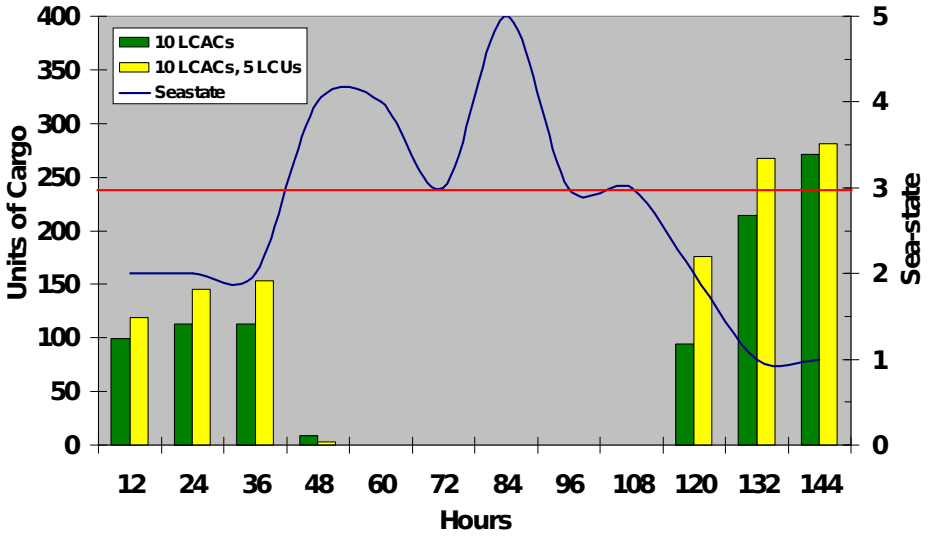
Environmental Data

- **Bathymetry, 1/2 mile grid**
- **Wave Heights (historical)**
- **Tidal fluctuations (ADCIRC)**

Ft. Story, VA



Eglin AFB, FL



Snapshot of Operations at T=24 hours
Ft. Story, VA

Loading

Transit to ship

ELCAS

Casting Off

Loading

Unloading

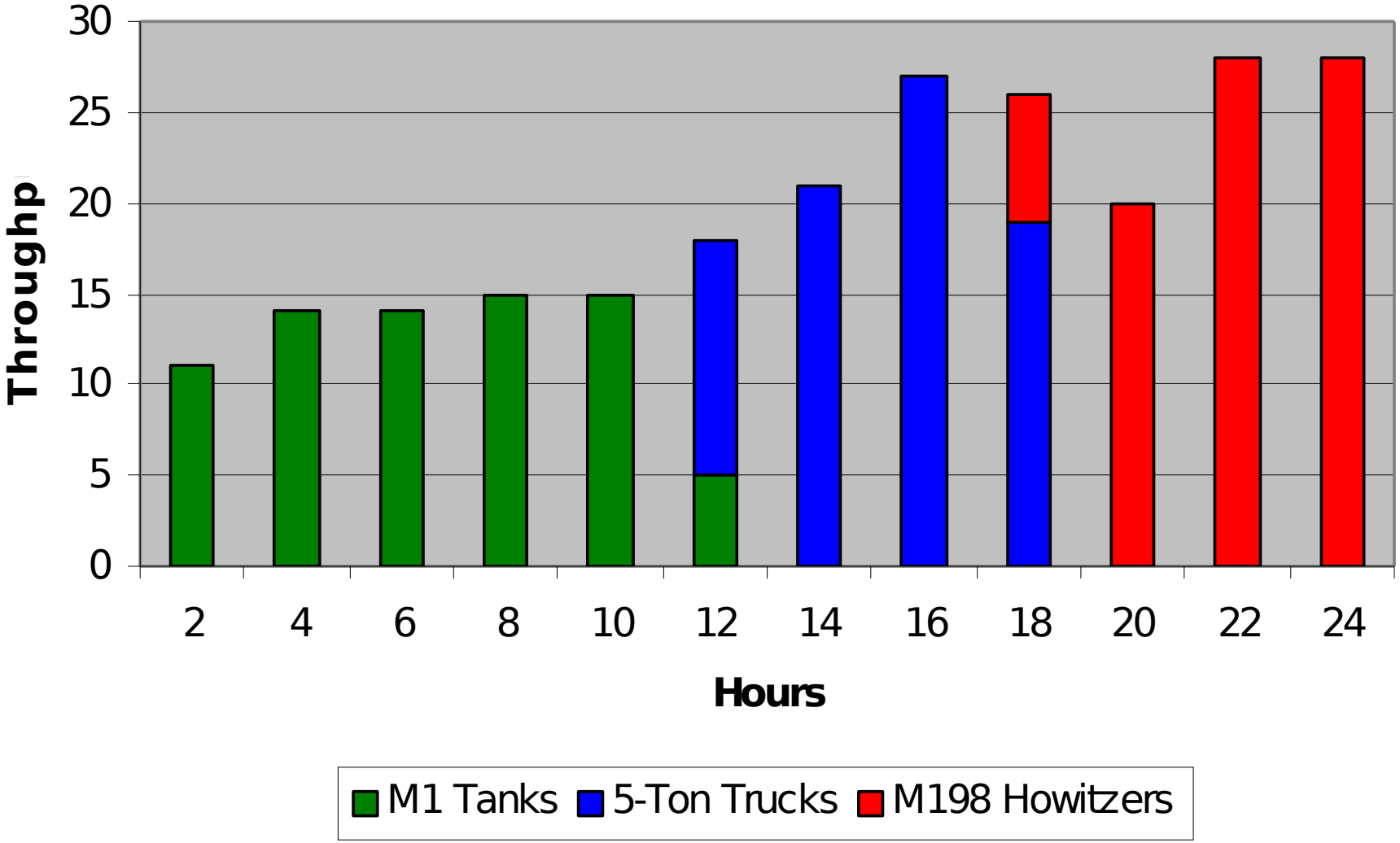
Bare Beach

Unloading

Bare Beach

Day 2 of LOTS Operations
Time is 0600 hrs
Current sea-state is 2
319 pieces of cargo moved onshore
19,583 tons of cargo moved onshore

Typical CITM Output Showing Prioritized



Beach Clearance Module for CITM

Purpose: To simulate the movement of cargo from a beach site to an inland marshaling area during a LOTS operation; to schedule equipment/ vehicle use in loading and unloading cargo from lighterage and movement of cargo while on the equipment/ vehicle; equipment/vehicle interaction with an input road network will also be considered, including traffic control and vehicle limitations on the given road surface; marshalling yard simulation will include unloading of cargo and placement of cargo into holding areas.

- Integrated into Coastal Integrated Throughput Model (CITM)
- Track amount of cargo moved from beach site to marshalling yard
- Simulate cargo loading at beach sites (ELCAS, Bare Beach, Causeway Piers, ADS) using military trucks and equipment through use of Container Transfer System vs.Operation Interoperability Matrix
  - Logistics Vehicle System (LVS
  - M878 Yard Tractor
  - M915 Tractor
  - M932 Tractor
  - M871 30-ft. Trailer
  - M872 40-ft. Trailer
  - M747 40-ft. Trailer
  - Rough Terrain Cargo Handler (RTCH)

(continued)

- Simulate movement to marshalling yard on road networks including traffic schedul
  - Road surface type
  - Number of road lanes
  - California Bearing Ratio
  - Road Capacity (tons/hr)
  - Maintenance threshhold

- Simulate cargo unloading and placement at marshalling yard holding areas

FY00 and Beyond

- CITM Ver. 1 given to MTMC and ANL in July 1999 to begin integration process into PORTSIM
- CITM Ver. 1 has been used in support of exercises (RSO&I, UFL)
- CITM Ver. 2 is under development

CITM Version 2

- Includes random effects
- Includes effect of nearshore bars on bare beach discharge
- Includes new lighter types
- Includes beach clearance/beach preparation module
- Includes long term wave climate analysis
- WARSIM/COMBAT XXI developers are interested in modifying CITM to simulate Amphibious Assault Operations

CITM

The Road to Successf
RSO&I